# U.S. ARMY CORPS OF ENGINEERS
# NEW ORLEANS DISTRICT
# QUALITY CONTROL PLAN

**Technical Document:** Fisher School Basin Detailed Project Report (DPR)

**Location:** The study area is located along the eastern bank of Bayou Barataria in Jefferson Parish, Louisiana. The Fisher School Basin is located in the town of Jean Lafitte.

**Project Description:** The purpose of this project is to provide flood protection for residential and commercial structures, against tidal and rainfall events. The proposed project consists of earthen levees, sheetpile floodwalls, and floodgates.

**Quality Control Process:** The Quality Control Plan (QCP) for the Fisher School Basin feasibility study provides a review mechanism insuring that quality technical products are developed by the New Orleans District.

**Technical Review:** All planning and engineering review tasks will be accomplished in-house because the necessary expertise is located at the New Orleans District. The Fisher School Basin feasibility study is part of the Continuing Authorities Program and is considered to be a low risk project.

Technical review will be accomplished through a combination of formal and informal meetings throughout the course of the study. The more formal IPT and TRT meetings are scheduled at prescribed intervals during the study. The informal, one-on-one review meetings should occur prior to the release of data and/or final products to another office, but will vary by functional area. This process should ensure that cost-effective solutions are developed, while maintaining technical standards and requirements.

**Technical Review Team:** The objective of the TRT is to verify assumptions, methods, and procedures in developing alternatives and a recommended plan. The TRT is responsible for performing an independent technical review of the proposed project to avoid redesign efforts and assure accountability for the technical quality of the product. The local sponsor is involved

throughout the study process by participating in the monthly coordination meetings and is invited to serve on the TRT.

In Planning, Programs and Project Management Division, TRT members were selected from each of the three branches. One or more reviewers will represent each functional area. The non-Federal sponsor will prepare the Environmental Assessment (EA) as part of its in-kind services to be provided for this study. The Environmental Analysis Branch, at the New Orleans District, will review and comment on the EA throughout the course of this study. The EA is part of the West Jefferson Levee District's in-kind services and was prepared by Coastal Engineering and Environmental Consultants (CEEC). The New Orleans District reviewed the EA as it was developed and submitted comments to CEEC.

In Engineering Division, TRT members were selected from the design offices based upon the study scope of work defined in the Project Study Plan (PSP). The following design offices will be represented: Cost Engineering Branch, Geotechnical Branch, Hydraulics and Hydrology Branch, Structures Branch and Civil Branch. One or more reviewers will represent each functional area.

**Engineering Design Team**

| Name | Function | Office | Ext |
|---|---|---|---|
| Rich Varuso | Geotech Rep | CEMVN-ED-FS | 2984 |
| Robert Bass | Hydraulics Rep | CEMVN-ED-HC | 1749 |
| Rita Gaudin | Relocations Rep | CEMVN-ED-SR | 2604 |
| Stephen Martinez | Cost Rep | CEMVN-ED-C | 1797 |
| Richard Tillman | Structures Rep | CEMVN-ED-TF | 2671 |
| Joey Wagner | Projects Engr | CEMVN-ED-SP | 1662 |

**Engineering Technical Review Team**

| | | | |
|---|---|---|---|
| Edwin Dickson | Engr Div Rep | CEMVN-ED | 1017 |
| Bruce Bivona | Geotech Rep | CEMVN-ED-FD | 1004 |
| Burnell Thibodeaux | Hydraulics Rep | CEMVN-ED-HM | 2445 |
| David Wurtzel | Relocations Rep | CEMVN-ED-SR | 2628 |
| Darrell Normand | Cost Rep | CEMVN-ED-C | 2727 |
| Sam Kearns | Levees Rep | CEMVN-ED-LH | 2718 |
| Lary Yorke | Structures Rep | CEMVN-ED-TF | 2664 |

**Project Management Production Team***

| | | | |
|---|---|---|---|
| Rodney Greenup | Study Manager | CEMVN-PM-W | 2613 |
| Toni Baldini | Economist | CEMVN-PM-AW | 1913 |

**Project Management Review Team**

| Name | Function | Office | Ext |
|---|---|---|---|
| Mark Wingate | TRT Manager | CEMVN-PM-W | 2512 |
| Brian Maestri | Economist | CEMVN-PM-AW | 1915 |
| Robert Martinson | Biologist | CEMVN-PM-RS | 2582 |
| Joan Exnicios | Archeologist | CEMVN-PM-RN | 1760 |

**Review Activities**

| DATE | | |
|---|---|---|
| Scheduled | Actual | |
| 10 Sep 97 | 10 Sep 97 | Develop QCP and designate technical review team members |
| 25 Sep 97 | 25 Sep 97 | TRT meeting to discuss alternative screening and review preliminary levee design |
| 26 Sep 97 | 26 Sep 97 | Resolve comments and complete alternative screening |
| 27 Feb 98 | 27 Feb 98 | Draft feasibility report complete and distributed to IPT and TRT members |
| 16 Mar 98 | 16 Mar 98 | TRT meeting to review and discuss comments on draft report |
| 17 Mar 98 | 14 Oct 98 | Resolve comments and prepare summary of technical review |
| 21 Sep 98 | 6 Nov 98 | Certify technical review for DPR |

**Quality Control Records:** Quality control records for both Planning, Programs and Project Management Division and Engineering Division will be maintained in a technical review package prepared by the IPT leader and summarized in the feasibility report. The package will consist of review comments from each reviewer and a certification checklist.

**Metric System:** The metric system WILL NOT be used for this project for the following reason(s):

All plans under consideration will be incorporated into existing parish drainage systems, which are all designed using the inch-pound system.

Project Manager — Date: 11/9/98

Engineering Division Design Coordinator — Date: 11/9/98

Technical Review Team Manager — Date: 11/9/98

# TECHNICAL REVIEW CHECKLIST

| Task/Issue | Completed/ Comment |
|---|---|
| **GENERAL** | |
| **AUTHORITY** | |
| a. Conformity with study authority? | YES |
| **SCOPE OF INVESTIGATION** | |
| b. Problems adequately addressed? | YES |
| **OBJECTIVE OF INVESTIGATION** | |
| c. Planning objectives clearly stated? | YES |
| **RISK-BASED ANALYSIS** | |
| d. Have the plans been sufficiently examined to determine the uncertainty inherent in the data or assumptions? | YES |
| **PROJECT COST SHARING** | |
| e. Is the apportionment of costs to local interests in conformance with present policy and evaluation procedure? | NO (*see below) |
| * *The fully funded first costs are estimated to be $9,962,000. The Federal limit for Section 205 projects is $5,000,000, of which approximately $311,000 is already expended. Therefore, the Fed share of first costs is $4,689,000 and the non-Fed share is $5,273,000 (which is greater than 50%).* | |
| f. Are there special circumstances that warrant consideration of increased non-Federal cost sharing? | YES |
| **COORDINATION** | |
| g. State/local/Federal coordination adequate, views considered? | YES |
| h. Conforms with laws, orders, & agency agreements? | YES |
| i. Preservation/conservation/historical/scientific interests consulted, views considered? | YES |
| **PUBLIC INVOLVEMENT** | |
| j. Was adequate public involvement conducted during the planning process to fully inform interested parties and to ascertain their views? | YES |
| k. Has there been adequate response to public concerns? | YES |
| l. Has the public involvement process been documented, and a discussion of the process prepared? | YES |
| **POLICY ASPECTS** | |
| m. Conforms to applicable policies? | YES |

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| **LEGAL/INSTITUIONAL** | |
| n. Does the draft PCA reflect applicable cost sharing and financing policies; policies regarding evaluation of in-kind non-Federal contributions; and other provisions required by law and policy for new start construction projects? | YES |
| o. Has the sponsor demonstrated that it possesses all authorities necessary to implement its responsibilities under the PCA or submitted a plan to obtain those authorities? | YES |
| **PLAN FORMULATION** | |
| **SCOPING** | |
| a. Have all reasonable alternatives, including non-structural and no-action plans been adequately addressed? | YES |
| **EXISTING CONDITIONS/ PLAN DEVELOPMENT** | |
| b. Have the assumptions and rationale for the without-project conditions been explicitly stated and are they reasonable? | YES |
| **ALTERNATIVE SCREENING** | |
| c. Have both beneficial and adverse effects been adequately evaluated for the selected plan and alternatives? | YES |
| d. Has acquisition of necessary land for future project elements been adequately considered? | YES |
| e. Has a reasonable justification been provided for eliminating alternatives? | YES |
| **PLAN SELECTION** | |
| f. Are the reasons for selection of major elements of the recommended plan sound and adequate? | YES |
| g. Does the selected plan conform with existing policy? If not have the reasons for departure been adequately documented? | YES |
| **REPORT REVIEW** | |
| h. Consistency with recent guidance? | YES |
| i. Major tech review issues/resolution documented? | YES |
| **ECONOMIC AND SOCIAL ANALYSIS** | |
| j. Are the assumptions regarding future alternative conditions clearly stated and justified, and are these assumptions reasonable? | YES |
| k. Is the without-project condition reasonable and does it actually reflect how non-Federal interests will act if the resource under study is not developed? | YES |

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| **ENVIRONMENTAL ANALYSIS** | |
| l. Adequate coordination conducted between Environmental, Engineering, and Real Estate? | YES |
| m. Coordination conducted with USFWS? | YES |
| n. HTRW survey performed? | YES |
| o. Have the project impacts been described, and impacts quantified with a habitat-based method? | YES |
| p. Have significant cultural resources been identified and evaluated? | YES |
| **ENGINEERING ANALYSIS** | |
| q. Is the supporting engineering data of sufficient detail to adequately describe the proposed design? | YES |
| r. Have alternative alignments been considered for project cost savings? | YES |
| s. Have adequate field investigations been conducted? Have adequate subsurface investigations been made to reasonable assure that the foundation is satisfactory? | NO (*see below) |
| * *Time and costs for surveys and soil borings were incorporated into the E&D estimate to reflect additional effort required during preparation of plans and specs.* | |
| t. Is the project constructable and operable? | YES |
| u. Are annual OM&R costs reasonable? | YES |
| v. Are quantity and cost estimates reasonable? | YES |

# QUALITY ASSURANCE AND TECHNICAL REVIEW SUMMARY

1. Technical review meetings for the subject study were conducted on 25 Sept 97, 16 Mar 98, 27 Aug 98, and 5 Oct 98. The technical review team was responsible for assessing the plan formulation, alternative analysis, environmental assessment, real estate supplement, and proposed levee design. A summary of the major comments is presented below:

a) COMMENT: Trapped water condition should be addressed from reverse head loading for stability and emergency drainage when system overtopped.

DISCUSSION: The TRT was concerned that in the event of overtopping, the exterior stages would subside faster than the interior drainage pumps could remove water and a reverse head on the levees would cause a failure.

RESOLUTION: H&H Br indicated that opening floodgates along Bayou Barataria would drain the area quickly and eliminate a reverse head condition.

b) COMMENT: Is drainage of levee system once overtopped considered in operation and maintenance costs?

DISCUSSION: No.

RESOLUTION: The O&M cost associated with overtopping is not significant.

c) COMMENT: Is any scour of materials on channel side of bulkheads considered in stability and/or O&M costs?

DISCUSSION: No.

RESOLUTION: The critical areas of the levee that are subject to scour and erosion are where Bayou Barataria is part of the GIWW. Areas subject to scour will be identified during P&S and the appropriate measures (riprap, armoring, etc.) will be included in the design. We do not anticipate riprap to be a significant cost.

d) COMMENT: Availability of sheetpile, if no exemption on "Buy American" clause should be addressed by Cost Engr Br.

DISCUSSION: Not Applicable

RESOLUTION: Not Applicable

e) COMMENT: Quality control of the earthen fill material should be stringent in these situations HTRW, environmental clearances, etc.

DISCUSSION: Design team concurs

RESOLUTION: Cost Engineering Branch assumed that a suitable borrow site can be located within five miles of the study area. A suitable borrow site will be identified during preparation of plans and specifications. Earthen material shall be tested to ensure compliance with Federal regulations concerning HTRW, water quality, environmental impacts, etc.

f) COMMENT: In light of the additional structural features added to the project, some funding should be provided to include a structures branch designer on the study team

DISCUSSION: Concur

RESOLUTION: Structures Br prepared a detail design and necessary report input.

g) COMMENT: Are project impacts on local storm water drainage into the adjacent waterway mitigated by additional drainage provisions

DISCUSSION: These features were not included in the draft report.

RESOLUTION: H&H Br. included a description of the interior drainage requirements for the final report.

h) COMMENT: Three soil borings were obtained for the study. Is this a sufficient number for development of P&S?

DISCUSSION: No. The hand-auger borings obtained during feasibility were used to identify different soil types and are not sufficient for developing project plans and specifications.

RESOLUTION: The cost of obtaining additional soil borings in the plans and specs phase is included in the project cost estimate.

i) COMMENT: Since this is single lift construction, the levee should be sufficiently overbuilt to accommodate the anticipated settlement and maintain the desired grade.

DISCUSSION: Concur

RESOLUTION: For feasibility, designers assumed six inches of settlement would occur over the entire reach. Soil borings and settlement calculations will be performed during P&S to refine these estimates.

j) COMMENT: In order to conserve costs, geo-fabric and 7-foot wide crown width should be considered in the levee design

DISCUSSION: The levee crown width was minimized to prevent vehicular access by unauthorized persons and to reduce project costs.

RESOLUTION: Geo-fabric may be incorporated into the final design. The levee crown width should remain at 5 feet.

k) COMMENT: The Fleming Curve pump station under construction was designed at elevations that are deficient to our current proposed project.

DISCUSSION: The West Jefferson Levee District indicated that the bulkhead for the new pump station is constructed to elevation 7.0 feet NGVD in order to tie into this proposed project.

RESOLUTION: During P&S, the as-built drawings shall be obtained from the West Jefferson Levee District to verify the elevation of the pump station, discharge pipes, bulkheads, etc.

l) COMMENT: There were no Real Estate representatives at the first technical review meeting. Some of the required relocations are private and the responsibility of RE Div

DISCUSSION: Concur

RESOLUTION: RE Div was provided a copy of the relocation items and consulted with Relocations Section to account for all relocation items affected by the project.

m) COMMENT: Relocations input was submitted ahead of the final design being prepared, thus resulting in some modifications later in the study process.

DISCUSSION: Concur

RESOLUTION: PD coordinated with Relocations to ensure that any changes in alignment were discussed and that additional relocations were included in the final report

n) COMMENT: Relocations personnel were not given sufficient time to officially correspond with affected owners

DISCUSSION: Additional time to develop costs was provided.

RESOLUTION: Relocations estimate was revised accordingly.

o) COMMENT: Report is not adequate to serve as the basis for preparation of plans and specifications due to lack of input.

DISCUSSION: Concur

RESOLUTION: Engineering Division was allowed to revise the original engineering design and provide additional background data, assumptions and calculations.

p) COMMENT: Engineering and Design costs for additional field investigations, design, and review work necessary to provide a basis for preparation of plans and specifications should be included as an item in the Total First Costs of the report.

DISCUSSION: Concur

RESOLUTION: Included in final report.

q) COMMENT: Design plates indicate existing bulkhead, which is to be removed, on the floodside of new sheetpile floodwall. Has the demolition, removal, and disposal cost for this work been included in the "Clearing and Grubbing" bid item?

DISCUSSION: The redesign by Structures Branch resulted in revised construction techniques. The new sheetpile floodwall will be constructed in the water where existing bulkheads interfere and on land where clearance permits.

RESOLUTION: The cost for clearing existing bulkhead is not required.

r) COMMENT: The typical all-earthen levee enlargements could pose stability problems. The proposed sections may have to be placed further from the bank, especially the section adjacent to the Barataria Waterway to achieve the proper safety factor.

DISCUSSION: Stability analyses were performed on composite design sections using LMVD Method of Planes Stability Analysis Program to achieve a minimum factor of safety of 1.3.

RESOLUTION: Verification of this analysis will be performed in P&S using additional boring data.

s) COMMENT: A statement should be made to address whether more borings and analysis will be performed to complete the project if the project goes beyond the feasibility phase.

DISCUSSION: Concur

RESOLUTION: Additional information is provided in the report.

2. All technical review documents will remain on file in Planning, Programs, and Project Management Division at the New Orleans District.

## COMPLETION OF INDEPENDENT TECHNICAL REVIEW

The New Orleans District has completed the feasibility study of the Fisher School Basin located in Jean Lafitte, Louisiana. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures, and material used in analyses' alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by an independent district team.

| Technical Review Team Members | | Date |
|---|---|---|
| Mark Wingate | Mark Wingate | 6 Nov 98 |
| Brian Maestri | Brian T. Maestri | 6 NOV 98 |
| Robert Martinson | Robert J. Martinson | 26 Oct 98 |
| Joan Exnicios | Joan M Exnicios | 6 Nov 98 |
| Edwin Dickson | Edwin M Dickson Jr | 26 Oct 98 |
| Bruce Bivona | Bruce J Bivona | 22 Oct 98 |
| Burnell Thibodeaux | Burnell Thibodeaux | 22 Oct 98 |
| David Wurtzel | David R Wurtzel | 30 Oct 98 |
| Darrell Normand | Darrell Normand | 10/21/98 |
| Sam Kearns | Sam Kearns | 10/23/98 |
| Lary Yorke | Lary D. Yorke | 26 Oct 98 |